

Q1. Choose the most suitable answer from the following [5Marks, 1/2 Mark each]:

- 1) Which one of the following is cookies privacy?
a. cookies does not permit sites to learn a lot about you
b. cookies permit sites to learn a lot about you
☒ c. cookie file kept on user's host, managed by user's browser
d. none of the above
- 2) For client-server model, which of the following is true for the clients? Choose many answer if any
a. Always have permanent IP address
b. May be intermittently connected
☒ c. May have dynamic IP addresses
d. Do not communicate directly with each other
- 3) A process sends/receives messages to/from
☒ a. Application layer
☒ b. Socket
c. TCP
d. UDP
- 4) For non-persistent HTTP, the total response time is
a. $2RTT + 2$ transmit time
☒ b. $1RTT +$ transmit time
c. $2RTT +$ transmit time
d. $1RTT + 2$ transmit time
- 5) Socket has:
a. Port number of the process only
b. IP address associated with a process only
☒ c. Port number and IP address associated with a process
d. None of the above
- 6) Which of the following is a transport service needed by an application
a. minimum throughput guarantees,
☒ b. Data loss consideration
c. Routing
d. Security
- 7) Which of the following is NOT true for STMP?
☒ a. P2P protocol
b. Client server protocol
c. Connection oriented protocol
d. Need Centralized server

- 8) _____ uses two separate ports for control connection and data connection
- HTTP
 - SMTP
 - POP3
 - FTP

- 9) Which of the following is NOT true for classless address block?
- The addresses in a block must be contiguous, one after another.
 - The number of addresses in a block must be a power of 2 (1, 2, 4, ...)
 - The first address must be evenly divisible by the number of addresses.
 - None of the above

- 10) Classful addressing use:
- divide the address into 6 categories.
 - divide the address into 5 categories.
 - divide the address into 4 categories.
 - doesnot divide them into categories

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Q2) Answer the following questions:

{28 marks}

- a. If we want to access 7 Objects using http protocol, compare between Persistent and nonpersistent http [4 Marks]

	Nonpersistent http	Persistent http
No of connection	one connection	7 connections
Response time	1 RTT + 7 object transmission time	7 (RTT + object transmission time)

0.5

- b. Explain what is meant by elastic applications.

[2 Marks]

an application that allow other application to use it

- c. give example of two elastic applications

[2 Marks]

skype, bittorrent.

- d. What is the mail transfer protocol used in the Internet? What are the possible mail access protocols used between the receiver's mail server and the user agent? What are the protocols used between the sender's mail server and the sender? [4 Marks]

The mail transfer protocol used in the Internet:

SMTP

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What are the possible mail access protocols used between the receiver's mail server and the user agent?

POP3
IMAP
HTTP

What are the protocols used between the sender's mail server and the sender?

SMTP

e. Compare between TCP and UDP protocol services

[6 marks]

	TCP	UDP
What is provided	multi user, hand shaking (setup), congestion control, overflow control, path	speed transmission, multi user
What is not provided	speed transmission	setup path, congestion control, overflow control
Connection	reliable	unreliable

f. Describe how Web caching can reduce the delay in receiving a requested object. Will Web caching reduce the delay for all objects requested by a user or for only some of the objects? Why? [4 Marks]

by using web caching client will take the object from proxy server so it's reduce the delay and reduce the traffic for other objects too, that's mean its reduce delay for all objects requested.

g. Consider an e-commerce site (e.g., Amazon.com) that wants to keep a purchase record for each of its customers. Describe how this can be done with cookies? [2 Marks]

- 1- when user enter Amazon.com the server will save Id number on host client on cookies file and register it in server DB.
- 2- next time the site Amazon.com will take the IP from the cookies to keep track and purchase.

h. What is the purpose of using cookies

[4 Marks]

- 1- Provide state of each user without include it in specific protocols.
- 2- fast way to keep track on website users to know what they want, and provide it to them.

Q3) Answer the following questions:

- a- II. What is the address space in each of the following systems?
A system with 16-bit addresses

$$2^{16} = 65536 \text{ addresses}$$

- b- An address space has a total of 256 addresses. How many bits are needed to represent an address?

$$\log_2(256) = 8, \text{ 8-bit.}$$

- c- Change the following IP addresses from dotted-decimal notation to binary notation.

- a. 190.34.16.108

$$10111110.00100010.00010000.01101100$$

- b. 170.14.36.89

$$10101010.00001110.00100100.01011001$$

- d- Change the following IP addresses from binary notation to dotted-decimal notation.
01101011.11110110.01100111.01010101

$$107.246.103.85$$

- e- In a block of addresses, we know the IP address of one host is 190.40.82.16/25.
1- What is the first address (network address) in this block?

$$190.40.82.0/25$$

- 2- What is the last address in this block?

$$190.40.82.127/25$$

- 3- How many hosts are in this block?

$$128$$

- f- Write the following masks in slash notation (/n).

- a. 255.255.0.0

$$/16$$

- b. 255.255.255.0

$$/24$$

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Q4) An ISP is granted a block of addresses starting with 190.60.16.0/23. The ISP wants to distribute these blocks to 8 organizations with 4 organization receiving just 16 addresses and another 4 receive 32 addresses.

- 1- Design the subblocks and give the start and last address for each block and slash notation for each subblock.

16 mask: /28	1-	First: 190.60.16.0/28	last: 190.60.16.15/28
	2-	First: 190.60.16.16/28	last: 190.60.16.31/28
	3-	First: 190.60.16.32/28	last: 190.60.16.47/28
	4-	First: 190.60.16.48/28	last: 190.60.16.63/28
32 mask: /27	1-	First: 190.60.16.64/27	last: 190.60.16.191/27
	2-	First: 190.60.16.192/27	last: 190.60.16.319/27
	3-	First: 190.60.16.320/27	last: 190.60.16.511/27
	4-	First: 190.60.16.512/27	last: 190.60.16.819/27

- 2- Find out how many addresses are still available after these allocations.

$$\text{No. address} = 2^9 = 512$$

$$\text{Used address} = 16 \times 4 + 32 \times 4 = 192$$

$$\text{Available address} = 512 - 192 = 320$$